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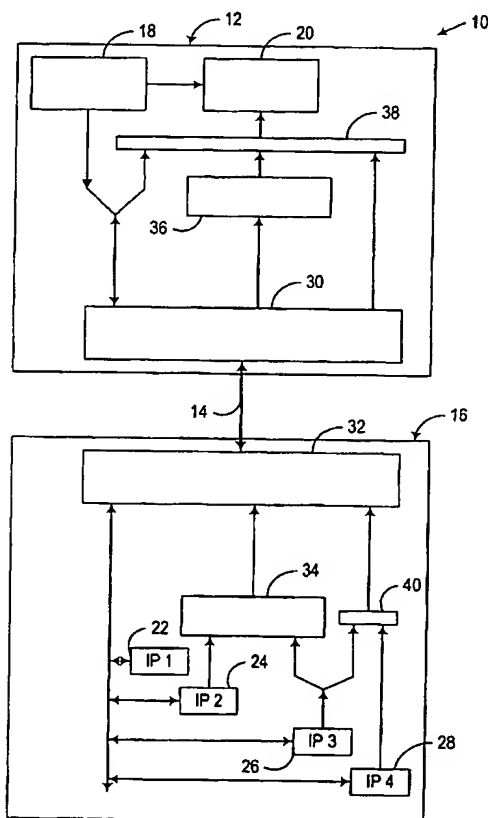
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(54) Title: DEDICATED ENCRYPTED VIRTUAL CHANNEL IN A MULTI-CHANNEL SERIAL COMMUNICATIONS INTERFACE



(57) Abstract: A data processing system, circuit arrangement, and method to communicate data over a multi-channel serial communications interface: such as a PCI-express connection (14) using a dedicated encrypted virtual channel from among multiple virtual channels supported by the communications interface (14). Encryption for the dedicated encrypted virtual channel is provided by a hardware encryption circuit (34) that is coupled to the interface, such that encryption may be performed at a relatively low level, and with substantial protection from compromise, particularly along chip boundaries. In one particular application, access control may be provided for a digital data stream using a multi-chip access control scheme that relies on one chip (148) to provide access control over a received digital data stream, with another chip (150) utilized to process the digital data stream once authorized to do so. A secure, multi-channel serial communications interface between the multiple chips re-encrypts a digital data stream that has been decrypted on the access control chip (148) using hardware encryption logic (162) disposed on the access control chip (148), communicates the re-encrypted digital data stream over a dedicated encryption virtual channel supported by the multi-channel serial communications interface, and decrypts the re-encrypted digital data stream using hardware decryption logic (164) disposed on the other chip (150).



SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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**Declaration under Rule 4.17:**

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 H04N5/00 H04N7/24		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 H04N G06F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the International search (name of data base and, where practical, search terms used) EPO-Internal, PAJ, WPI Data, INSPEC		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	MAYHEW D ET AL: "PCI express and advanced switching: evolutionary path to building next generation interconnects" PROCEEDINGS OF THE 11TH SYMPOSIUM ON HIGH-PERFORMANCE INTERCONNECTS-HOTI'03, 20 August 2003 (2003-08-20), pages 21-29, XP010657970 page 21, left-hand column - page 23, left-hand column page 25, left-hand column, paragraph 2.2.2 ----- -/--	1-45
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.		
<input checked="" type="checkbox"/> Patent family members are listed in annex.		
<b>* Special categories of cited documents:</b> <div style="display: flex; justify-content: space-between;"> <div> <p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p> </div> <div> <p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*S* document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search 16 December 2004		Date of mailing of the international search report 29/12/2004
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer Carnerero Álvaro, F

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>EP 0 952 733 A (SONY UK LTD) 27 October 1999 (1999-10-27)</p> <p>column 1, paragraph 3 - paragraph 5 column 2, paragraph 11 - paragraph 14 column 22, paragraph 169 - column 23, paragraph 171</p>	<p>2, 11-15, 23, 32, 41, 42, 44, 45</p>
Y	<p>EP 0 875 813 A (SONY CORP) 4 November 1998 (1998-11-04)</p> <p>abstract</p>	<p>2, 11-15, 23, 32, 41, 42, 44, 45</p>
A	<p>WO 01/74071 A (SONY ELECTRONICS INC) 4 October 2001 (2001-10-04) abstract</p>	<p>1-45</p>

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IB 03/06012

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0952733	A	27-10-1999	GB 2336742 A	27-10-1999
			GB 2336743 A	27-10-1999
			GB 2336744 A	27-10-1999
			GB 2336745 A	27-10-1999
			EP 0952733 A2	27-10-1999
			JP 2000032016 A	28-01-2000
			US 2002196374 A1	26-12-2002
EP 0875813	A	04-11-1998	JP 10301492 A	13-11-1998
			EP 1298517 A1	02-04-2003
			EP 0875813 A2	04-11-1998
			ID 20227 A	29-10-1998
			TW 379308 B	11-01-2000
			US 6256391 B1	03-07-2001
			US 2003191956 A1	09-10-2003
WO 0174071	A	04-10-2001	AU 5090801 A	08-10-2001
			WO 0174071 A1	04-10-2001